

**ORCHESELLA QUINQUEFASCIATA (BOURLET, 1843)
(COLLEMBOLA: ENTOMOBRYIDAE) FROM CHALK GRASSLAND
IN THE SOUTH DOWNS**

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Abstract

The Collembolan *Orchesella quinquefasciata*, which has not previously been reliably recorded in the UK, has been collected from long grass at the edge of yew forest in Kingley Vale, Sussex. It was found to co-occur with a similar community of other Collembola in Kingley vale as it does in grasslands in the Netherlands. Its density increased significantly away from the path edge.

The genus *Orchesella* contains some of the largest Collembola (5mm), readily recognised by their colour patterns. Hopkin (2000) recognises seven species in the UK, of which *O. quinquefasciata* Bourlet 1843 is described as having “A handful of records from Hampshire, Devon and Wales, [...] its presence in our region needs confirmation”. Additionally, no specimen appears to exist of UK-collected material of this species (Hopkin, pers. comm.). This species is widely if thinly spread on mainland Europe, with published records from Czechoslovakia (Nosek 1969, finding it in woods but at highest densities in meadows), France (Cortet & Poinsoot-Balaguer 1998, Benito & Sanchez 2000 both reporting it from woodland), Italy (Kopeszki & Meyer 1996 from woodland) Spain (Lucianez & Simon 1991, under brushwood) and Switzerland (Gisin 1943, stony meadows on chalk), all authors agreeing it to be a rare species. Unpublished surveys by MPB have found it in fewer than ten sites in Netherlands, while Gisin (1960) summarizes its distribution as “middle-European”.

It is readily identified by having a bold median dark line along its thorax in addition to two lateral lines each side. The two lateral lines converge on the end of abdominal segments three and four. This species closely resembles the immature and female stages of *O. flavescens* Bourlet 1839, but in the latter species the lateral lines do not converge. *Orchesella villosa* Geoffroy 1764 is a much commoner species with similar markings but lacks the dorsal line.

We report here the discovery of *Orchesella quinquefasciata* from chalk grassland in the South Downs. The study site was at the north end of Kingley Vale NNR (O.S. grid reference SU820113), consisting of chalk grassland (at the edge of ancient yew forest) dominated by Tor grass *Brachypodium pinnatum* Beauv. and Yorkshire fog grass *Holcus lanatus* L. on a black rendzina soil (pH 7.25, 47% water content when re-sampled in September 2002). The dicotyledenous plant community was dominated by calcicoles, notably Wild Basil *Clinopodium vulgare* L., Wild Parsnip *Pastinaca sativa* L., Marjoram *Origanum vulgare* L., Salad Burnett *Sanguisorba minor* Scop, and Lady's Bedstraw *Galium verum* L. Turf samples (six replicates of 9cm diameter) were removed in September 1999 by trowel from grassland at two

distances (1m or 5m) from two trampled paths at, wrapped in plastic film, and extracted in a simple Tullgren system, the Collembola identified using Hopkin (2000) and Fjellberg (1982). A total of thirteen species were recorded (Table 1) including 26 individuals of a conspicuous five-striped Collembolan determined to be *O. quinquefasciata* by MPB, who has previous experience of the species from mainland Europe. Mann-Whitney U tests showed *O. quinquefasciata* to be significantly less common 1m from the path than at 5m ($p < 0.05$), although the difference was not significant differences for any other species. A revisit in September 2002 relocated the species at low densities in long grass by the forest edge.

This is a visually striking creature under a binocular microscope due to the five bold purple thoracic lines standing out against its pale yellow ground colour, and may be expected to be reported from long grass elsewhere in the UK. These data suggest it to be relatively intolerant of disturbed, compacted conditions. The remainder of the named Collembola discovered were common, widespread species, although it is worth noting that *Cyphoderus albinus* is a myrmecophile, its high frequency here suggesting a high density of suitable ant hosts.

Orchesella quinquefasciata is found in the Netherlands in a similar Collembolan community in damp meadows. Table 2 lists Collembola from De Veenkampfen at

Table 1. Collembola from Kingley vale grassland.

Species	Density m-2	Number of records (from 24)
<i>Orchesella quinquefasciata</i> (Bourlet 1843)	61	11
<i>Brachystomella parvula</i> (Schäffer 1896)	934	21
<i>Cyphoderus albinus</i> Nicolet 1841	111	11
<i>Folsomia candida</i> Willem 1902	7	1
<i>Folsomia quadrioculata</i> (Tullberg) 1871	4	1
<i>Isotoma viridis</i> Bourlet 1839	481	15
<i>Lepidocyrtus cyaneus</i> Tullberg 1871	623	20
<i>Lepidocyrtus lanuginosus</i> (Gmelin 1780)	12	2
<i>Parisotoma notabilis</i> Schäffer 1896	3868	23
<i>Protaphorura</i> sp	660	15
<i>Pseudosinella alba</i> (Packard 1873)	14	1
<i>Sminthurides</i> spp	601	23
<i>Sminthurinus aureus</i> (Lubbock 1862)	40	3

Wageningen, a wet grassland containing *O. quinquefasciata*, showing both systems to contain *Lepidocyrtus cyaneus*, *Isotoma notabilis*, *Isotoma viridis*, a second *Lepidocyrtus* species, a *Sminthurides* species, a *Sminthurinus* species and a *Protaphorura* species. These are all common and widespread taxa, but the degree of overlap between the lists could imply that *O. quinquefasciata* is a member of a

specific grassland Collembolan assemblage. In order to assess the statistical significance of this observation one would need access to a large number (>200) of Collembola community datasets and apply a Monte-Carlo analysis (Manly 1991).

Species	Density m-2	Number of records (from 35)
<i>Orchesella quinquefasciata</i> (Bourlet, 1843)	25	13
<i>Anurida ellipsoides</i> Stach, 1849	75	9
<i>Arrhopalites caecus</i> (Tullberg, 1871)	6	4
<i>Entomobrya nivalis</i> (Linn., 1758)	6	3
<i>Folsomia quadrioculata</i> (Tullberg, 1871)	230	8
<i>Friesea truncata</i> Cassagnau., 1958	26	8
<i>Isotoma viridis</i> Bourlet, 1839	59	12
<i>Isotomiella minor</i> (Schäffer, 1896)	329	23
<i>Isotomurus palustris</i> (Müller, 1776)	232	22
<i>Lepidocyrtus cyaneus</i> Tullberg, 1871	4929	35
<i>Lepidocyrtus lignorum</i> (Fabricius,)	1662	34
<i>Megalothorax minimus</i> (Willem, 1900)	2	1
<i>Mesophorura macrochaeta</i> Rusek, 1976	21	10
<i>Neanura muscorum</i> (Templeton, 1835)	1	1
<i>Parisotoma notabilis</i> Schäffer, 1896	1838	23
<i>Protaphorura boedvarssoni</i> Pomorski, 1993	184	15
<i>Pseudosinella alba</i> (Packard, 1873)	14	1
<i>Sminthurides malmgreni</i> (Tullberg, 1876)	61	18
<i>Sminthurinus elegans</i> (Fitch, 1863)	52	4
<i>Sminthurus viridis</i> (Linn., 1758)	43	14
<i>Sphaeridia pumilis</i> (Krausbauer, 1902)	215	27

Table 2. Collembola from Dutch grasslands containing *O. quinquefasciata*.

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More on woodlice and spiders

Whilst the association between woodlice and spiders is nothing new – *Dysdera crocata* Koch (Araneae, Dysderidae) is widely known as the “woodlouse spider” on account of its preferred diet, the observation by Richard Jones of a specimen of *Porcellio scaber* Latreille (Isopoda, Porcellionidae) in a spider’s web (*Ent. Rec.* **114**: 181) is possibly of more significance than the author intended.

In the British Isles, *Porcellio scaber* is the main host of *Melanophora roralis* L. (Dipt.: Rhinophoridae) although Irwin, 1985 (*Ent. Mon. Mag.* **121**: 38) discovered an association with *Porcellio spinicornis* Say. However, in 1927 W. Lundbeck, when dealing with the “Tachinidae” of Denmark (*Diptera Danica* **7**: 239-264) stated the following in relation to the fly. “Mr. E. Hoffmeyer bred it from egg-masses of [the spider] *Epeira cornuta*, and he communicated to me that the larva was not uncommon in this way; the imago appeared on 1/7”. This alleged association entered the wider British literature in 1942 when Audcent published “A preliminary list of the hosts of some British Tachinidae” (Dipt.). *Trans. Soc. Br. Ent.* **8**: 1-42) and was repeated by van Emden (1954. *Handbooks for the Identification of British Insects* **10**: part 4(a) and also Herting (1961. *Rhinophoridae in Lindner (ed) Die Fliegen der Paläarktischen Region* 216).

In 1956, A. E. Le Gros (*Ent. Rec.* **68**: 111) challenged this on the grounds that the Rhinophoridae are parasites of woodlice. He stated that he had often reared ichneumonids from the egg masses of *Araneus cornutus* Clerck (Araneidae), and had sometimes found beetles, earwigs and woodlice within the retreats of the spider where they had probably crawled for shelter. He concluded “I would suggest that Lundbeck’s record had its origin in a parasitised woodlouse crawling into a *cornutus* retreat and dying; and that the larvae Hoffmeyer found “not uncommon” were probably those of ichneumons which heavily infest *cornutus* egg sacs”.— LAURENCE CLEMONS, 14 St. John’s Avenue, Sittingbourne, Kent ME10 4NE.